The Corps
of
Royal Canadian Electrical and Mechanical Engineers

LORE in 1969

Maintenance in a Task Force

Maintenance Support Plan for a Battalion Group Task Force in Defence of Canada Operations

By

Major C.A. Millar

The RCEME Heritage Archives

LORE in 1969

Maintenance in a Task Force

And

Maintenance Support Plan for a Battalion Group Task Force in Defence of Canada Operations

By

Major (later Colonel) C.A. Millar
OC 1 Service Battalion Maintenance Company

Scanned and edited by LCol (Ret'd) L.L. Hellemans

Editor's Note

In June 1969, Major Arn Millar prepared two presentations describing the proposed contemporary doctrine for the operation of a LORE maintenance company, specifically 1 Service Battalion Maintenance Company in 1 Combat Group.

The original presentations are in the form of briefing notes and handouts – long before the days of MS-PowerPoint® presentations – and are valuable in that they reflect the method of operations that was in force and being considered at the time. The original documents have been slightly restructured to improve readability in this format, although the text has not been changed. To accommodate a modern audience, some explanations have been placed in square brackets [ ]. The editor thanks LCol (Ret'd) L.L. Hellemans for scanning and editing the originals.

Doug Knight
February 2009

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1 Combat Group
1 Service Battalion Maintenance Company

Maintenance in a Task Force

Over the past few years, the maintenance elements of the land force have experienced a violent upheaval. That traumatic experience has also been shared by most of our Canadian Forces, but we seem to have weathered the storm so far, and the aim of this presentation is to sort out what has happened, what we now have, and where we may be headed in terms of second line maintenance resources within the land environment.

The maintenance organization collapsed for a period of time, but technical channels of communication are now being re-established, and a new structure is developing. Prior to integration and the formation of commands and bases, the land environment had a clearly defined maintenance organization for support beyond the unit level. There were local RCEME workshops across the country, commanded through the area and command Electrical and Mechanical Engineers by the director at CFHQ. All technical control, and command, was exercised on that net. The field force maintenance organization was also clearly defined, whereby the second line or field workshops were commanded through the CREME [Commander, RCEME] at division HQ. When 1 Canadian Infantry Division disbanded in 1958, command of the field workshops was decentralized to the brigade groups, although technical direction continued to be exercised by the director.

The 1960’s brought shattering blows to organized land maintenance support. The reorganization of CFHQ, the creation of functional commands, and the development of the base concept completely disrupted the technical communication system.

In 1966, after the creation of Mobile Command, came a new proposal for the land force. Maintenance support was to be centralized within a maintenance battalion consisting of light field workshops in Calgary and Petawawa, mechanized field workshops in Gagetown and Germany, a medium field workshop, and detached elements (which at that time consisted of a workshop with UNEF [United Nations Emergency Force] in Egypt and base workshop elements in North-west Europe).

The maintenance battalion headquarters was not to be formed in peacetime, except when a divisional-sized task force headquarters was required. The light field workshops were to be air-transportable, but were only capable of providing 50% of the total maintenance effort required to support a light brigade. The remaining 50%, plus heavier tooling and equipment, was placed in the medium field workshop. Mechanized field workshops were scaled for 80% of the required manpower, with the remaining 20% assigned to the medium field workshop. At the same time, the Canadian Airborne Regiment (CAR) was formed, and its second line maintenance was also assigned to the medium field workshop. The medium field workshop was therefore to support the Airborne Regiment and provide a light field workshop or a mechanized field workshop at what is now called the auxiliary second line maintenance level.

I don’t like to bore you with a historical discussion, but these developments have a distinct bearing on the shape of 1 Service Battalion Maintenance Company today.

At that time (1966) it was not intended to activate an entire medium field workshop. The equipment was to be authorized, and 100% of the CAR maintenance slice was to be manned, but otherwise only a small caretaker staff was envisaged on a permanent basis for the workshop. Shortly after the force structure was circulated, 1 Field Workshop in Calgary was designated as a light field workshop, and training became oriented towards air portability.

The general tactical concept at that time is of interest. It was considered that if hostilities broke out in an area outside Canada, to which Canadian land forces were to be committed under UN or NATO obligations, the CAR would be air-dropped or air-landed into the operations zone as rapidly as possible.

Since the CAR might have to be independently supported in operations for up to several months, a second line maintenance increment was included for that task force. It was considered that augmentation would be required after 30 to 45 days. If sustained operations were required, a light air-transportable brigade would be moved in to support or relieve the CAR. That brigade would contain its integral light field workshop. Since the light field workshop only contained 50% of the required maintenance support, augmentation would eventually be needed from the medium field workshop.

Today, if Canada is asked to provide a UN or NATO task force for an operation outside the country, say in Nigeria, the CAR would be activated and either air-landed or air-dropped at the most suitable base of operations. In this case, it might be the coastal city of Lagos. The regiment has an integral second line maintenance field service support element which would arrive in the area shortly after the commandos have been deployed.

If the operation becomes sustained and the zone of activity moves away from the base, it could be expected that a light brigade would be activated and air-transported into the area, either to augment or replace the CAR, which would probably be returned to Canada, leaving its second line maintenance element behind as a nucleus of auxiliary second line repair support for the light brigade.

The light brigade contains its integral light field workshop, capable of providing 50% of the repair support for the brigade by the deployment of air-transportable mobile repair elements.

If operations are sustained, auxiliary second line repair support will be necessary, therefore a medium field workshop contained in the mobile base concept will be moved by air and/or sea into the base of operations for continued support to the deployed formation.

This concept has never been directly ratified by CFHQ to unit level, but subsequent Mobile Command policy letters indicate that the basic idea is still valid.

In 1967, a further refinement of the maintenance concept was presented. This paper stated that field maintenance organizations, along with other administrative units, were to be commanded by administrative commanders, who would exercise control by designating operational guidelines and exercising staff control, by exception, to meet operational priorities. Within the guidelines to be set by the administrative commander (probably the CO of the service battalion), the CO of the field maintenance unit was to be responsible for the co-ordination and control of all maintenance activities within a formation including:

1. The provision of field (second line) repair, recovery, and backloading services,
2. The provision of spare parts (first and second line),
3. Technical control of all maintenance activity in the formation,
4. The provision of technical advice and assistance to unit commanders,
5. Technical liaison with the senior EME (or equivalent) at higher formation, and
6. The provision of maintenance liaison officers for command staff.

The complete spare parts platoon and brigade EME staff were incorporated into the establishment of field workshops at that time. Technical control was thus contained wholly with the maintenance battalion through the battalion commander, CO of the field workshop, and maintenance platoon commanders.

The role of the CAR was amplified at that time, to include:

1. The regiment must be able to operate independently from D day to D + 7 without any second line support.
2. By D + 7 the mobile base element for the CAR would be deployed.
3. The regiment, supported by the mobile base, would have to be capable of operating until D + 90.
4. In the event that a light brigade is committed to the operation, the CAR would probably be withdrawn.
5. The supporting element of the mobile base would remain and form a portion of the mobile base to support the light brigade.

The light field workshop role was stated as the provision of assistance to a task force, consisting of light units, in achieving its mission. The workshop was redesigned to support peacekeeping and limited war operations, with a note that during the warning phase, the workshop must be tailored to the needs of the task force. It was indicated that the task force would always be supported in some degree by a base, through which all administrative support required by the force would be channelled. In overseas theatres, that base was to be provided by the mobile base units of the field force structure. In Canada, the base was to be provided by the closest suitable base, augmented as required by mobile base units. That outline went on to say that there would be a mobile base maintenance unit provided to support the deployed field workshop, that the support facilities would include the heavier and static repair resources, and that the support would also contain mobile elements, which might be sent forward either for in-situ repairs, or to augment the light field workshop when its capability was such that it could no longer support the complete task force workload. A provision was also included that the workshop would not normally undertake repair tasks that could not be completed in 48 hours. The manpower was yardsticked using a few assumptions such as:

1. Augmentation would be provided for radio repair on yearly inspections, limited war operations, or extended peacekeeping activities.
2. Only 40% weapon repair capacity was required for artillery, because those equipments would have limited use, particularly in peacekeeping operations.
3. Only a small number of personnel need be made available for small arms, instrument, and ancillary equipment inspections and emergency repairs, since small and complex items beyond the local capability could be returned to the base and replaced through resupply facilities.

The light field workshop was envisaged as a parts-changing organisation, with a mobile repair capability for in-situ tasks. Most vehicle casualties and all other equipments were to be backloaded through equipment collecting points or delivery points to the workshop located in the brigade administrative area.

Spare parts were to be provided by the spare parts platoon from messages and demands. Urgent demands were to be guaranteed delivery by special vehicle or helicopter within 12 hours, normal demands were to be sent forward by first available means, and bulk demands were to be made through DPs within seven days.

The medium workshop was not designated as being a tactically deployable organization at that time. As was stated before, it was considered only as a grouping of maintenance elements for peacetime administration, command, and control. The CAR element was to be active, but the remainder was primarily a caretaker grouping. Its tasks, when activated, were to provide a workshop for an overseas theatre base, or to provide the equivalent of a light field workshop for maintenance support of a multi-national force, such as the one sponsored by the United Nations in the UNEF.

Maintenance support for a deployed light brigade in an operational theatre might consist of the following elements:

1. A maintenance section in each forward company, squadron or battery,
2. A maintenance platoon or troop in each infantry battalion, armoured regiment, or artillery regiment,
3. A light field workshop for the light brigade group, and
4. A medium field workshop with CAR increment in the mobile base.

Each maintenance platoon, troop, or section supports its parent unit or sub-unit with repair, recovery, and spare parts services at the first line level.

Items of equipments requiring repair beyond the capability of these first line resources would be backloaded to equipment collecting points established immediately to the rear of unit lines, or through delivery points. Essential pieces of equipment which must be repaired in-situ would be handled by mobile repair teams from the light field workshop, which supports the brigade. Recovery beyond unit resources would also be carried out by that workshop.

The forward repair platoon, or mobile repair team, concept was originated when the nuclear battlefield setting was envisaged, and it was anticipated that the distance between the units and field workshop could be 70 miles. In UN or non-nuclear operations, the distance will probably be about five miles, therefore it will not be economical to deploy resources forward of the field workshop site, except when fluid tactical operations require such an element, or an operation is in jeopardy.

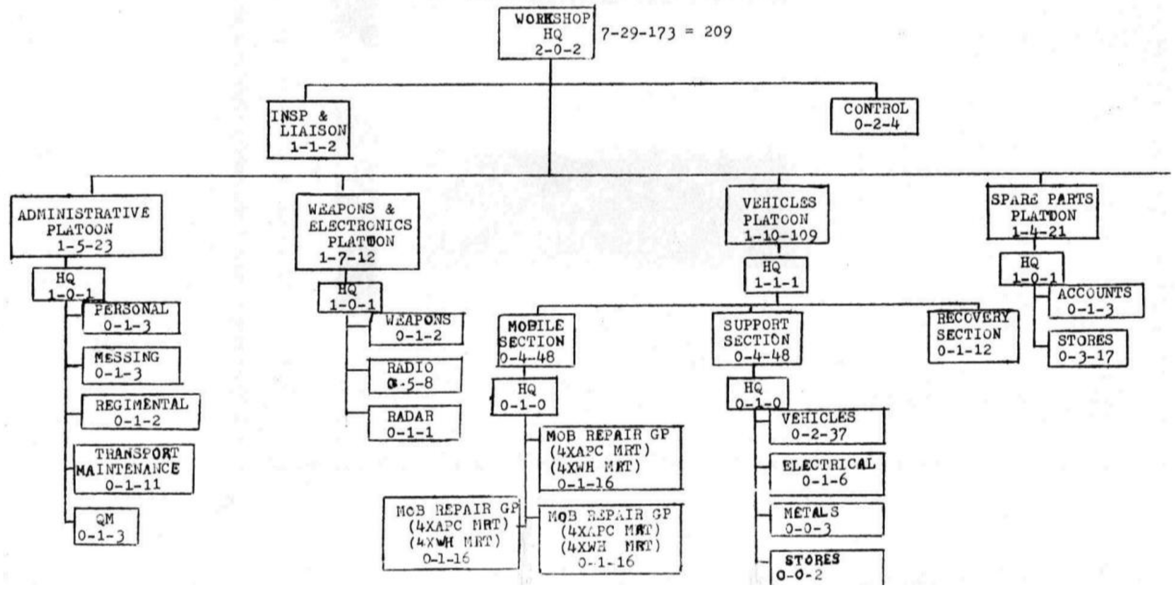
Most second line repair work will therefore be carried out at the field workshop site.

The light workshop has only 50% of the required capacity for sustained brigade operations, therefore augmentation will be required during peak activity periods.

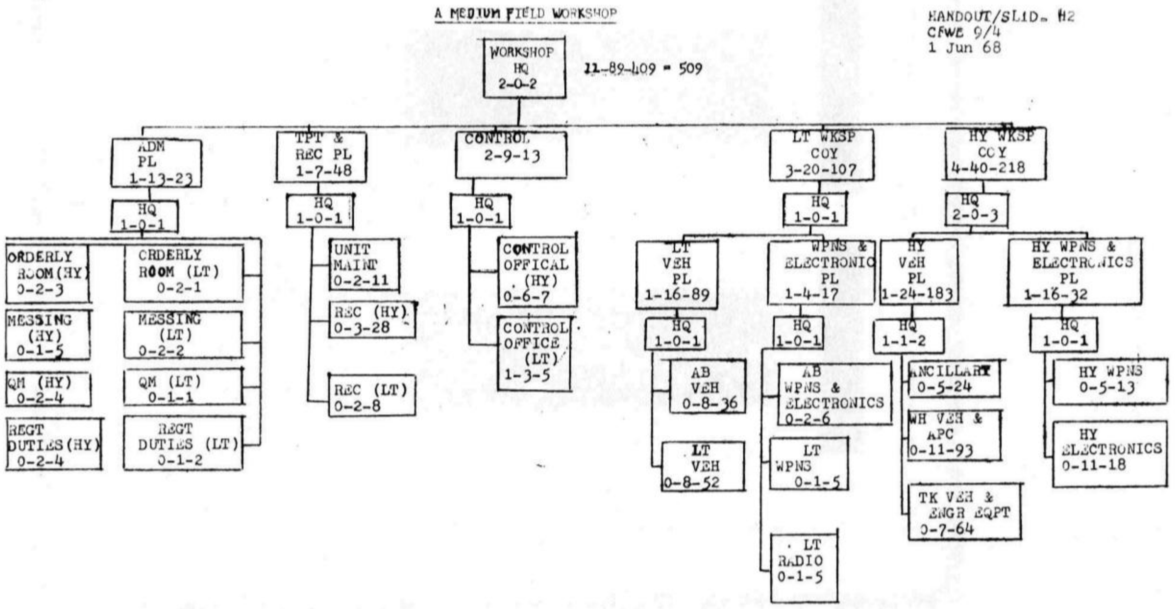
HANDOUT/SLIDE H1
CFWE 9/3
1 Apr 68

A LIGHT FIELD WORKSHOP

ORGANIZATION CHART



The war establishment for a medium field workshop in the mobile base role (CFWE 9/4 d/1 Jun 69) actually contains two complete workshops. That organization gives it the capability to deploy auxiliary second line repair and recovery support forward to augment the light field workshop at its site, or give additional mobile repair team activity for in-situ repairs, while retaining the heavier repair and recovery support facilities as a working organization at the mobile base site. The CAR elements can be seen within that establishment as an integral part of the facility.



You will note that, although second line spare parts supply to all units of the brigade and to the light field workshop is included in the organization of that workshop as its spare parts platoon, no spare parts element has been given to the medium field workshop.

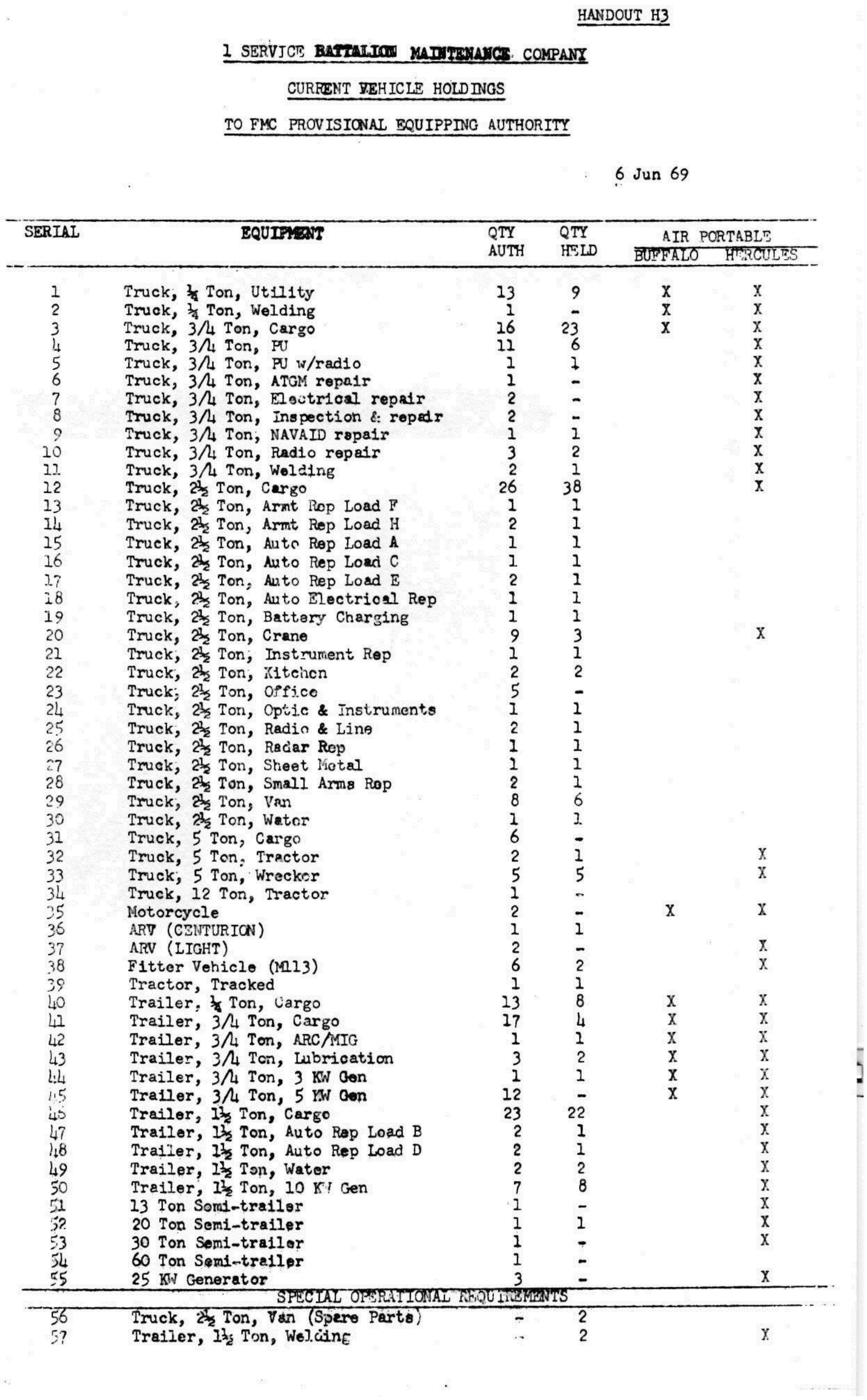
In 1968, a radical change of the force structure took place when manpower restrictions within Mobile Command forced the integration of base and field support elements, primarily as an economy measure.

The object at that time was to redefine the available service support capability in terms of a structure as closely related to a field organization as possible, so that a rapid transition from static to field posture could be achieved when forming task forces for deployment. 1 Field Workshop was integrated into 215 Workshop (CFB Calgary Base Maintenance Section) and became 1 Service Battalion Maintenance Company. The role was also changed, in that the service support elements of 1 Combat Group became charged with the requirement to form the basis of a deployable mobile base in conjunction with 3 Combat Group from Gagetown. The Service Battalions of 1 and 3 Combat Groups were given the major training responsibility of developing expertise in mobile base operations at that time, along with the tasks of keeping personnel trained in field operations in the same environments reflected by the tasking of the parent combat group.

Recently, the integrated base/field concept was amplified, a personnel establishment was published, and a provisional equipping authority was approved.

I'm afraid I've been long winded up to this point, but you can probably appreciate the confusion which has existed in the maintenance field over the past few years, although it has probably not been much different from the uncertainty in other fields. However, this preamble brings us up to what we have today in terms of second line maintenance support for a task force.

Well, first we have equipment. The diagram below gives you a breakdown of our current situation in terms of the entitlement. Please note that, at a time when almost every other unit in 1 Combat Group is being reduced, the maintenance company is being increased by some 48 vehicles. The primary reason is our change of basic role to mobile base responsibility. We now have a larger heavy repair capability, but will become relatively less air-transportable. However, it does increase our flexibility in the provision of resources for support of various task force groupings. The equipment of a light field workshop is included in this entitlement, complete with its associated mobile repair teams.



HANDOUT H3

1 SERVICE BATTALION MAINTENANCE COMPANY

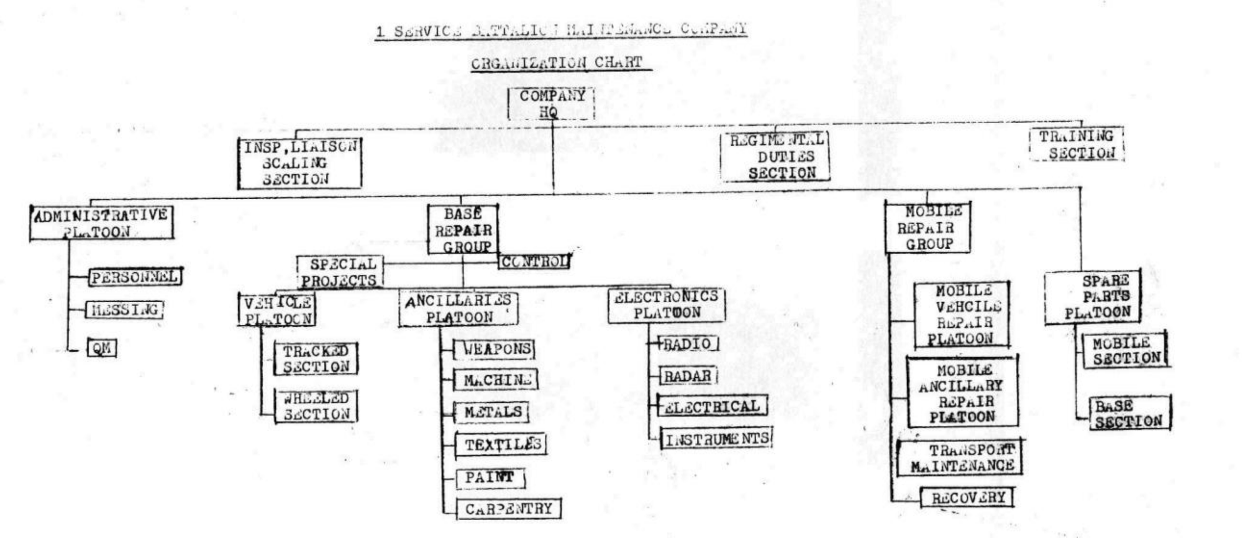
CURRENT VEHICLE HOLDINGS

TO FMC PROVISIONAL EQUIPPING AUTHORITY

6 Jun 69

SERIAL	EQUIPMENT	QTY AUTH	QTY HELD	AIR PORTABLE	
				BUFFALO	HERCULES
1	Truck, ¼ Ton, Utility	13	9	X	X
2	Truck, ¼ Ton, Welding	1	-	X	X
3	Truck, 3/4 Ton, Cargo	16	23	X	X
4	Truck, 3/4 Ton, PU	11	6		X
5	Truck, 3/4 Ton, PU w/radio	1	1		X
6	Truck, 3/4 Ton, ATGM repair	1	-		X
7	Truck, 3/4 Ton, Electrical repair	2	-		X
8	Truck, 3/4 Ton, Inspection & repair	2	-		X
9	Truck, 3/4 Ton, NAVAID repair	1	1		X
10	Truck, 3/4 Ton, Radio repair	3	2		X
11	Truck, 3/4 Ton, Welding	2	1		X
12	Truck, 2½ Ton, Cargo	26	38		X
13	Truck, 2½ Ton, Armt Rep Load F	1	1		
14	Truck, 2½ Ton, Armt Rep Load H	2	1		
15	Truck, 2½ Ton, Auto Rep Load A	1	1		
16	Truck, 2½ Ton, Auto Rep Load C	1	1		
17	Truck, 2½ Ton, Auto Rep Load E	2	1		
18	Truck, 2½ Ton, Auto Electrical Rep	1	1		
19	Truck, 2½ Ton, Battery Charging	1	1		
20	Truck, 2½ Ton, Crane	9	3		X
21	Truck, 2½ Ton, Instrument Rep	1	1		
22	Truck, 2½ Ton, Kitchen	2	2		
23	Truck, 2½ Ton, Office	5	-		
24	Truck, 2½ Ton, Optic & Instruments	1	1		
25	Truck, 2½ Ton, Radio & Line	2	1		
26	Truck, 2½ Ton, Radar Rep	1	1		
27	Truck, 2½ Ton, Sheet Metal	1	1		
28	Truck, 2½ Ton, Small Arms Rep	2	1		
29	Truck, 2½ Ton, Van	8	6		
30	Truck, 2½ Ton, Water	1	1		
31	Truck, 5 Ton, Cargo	6	-		
32	Truck, 5 Ton, Tractor	2	1		X
33	Truck, 5 Ton, Wrecker	5	5		X
34	Truck, 12 Ton, Tractor	1	-		
35	Motorcycle	2	-	X	X
36	ARV (CENTURION)	1	1		
37	ARV (LIGHT)	2	-		X
38	Fitter Vehicle (M113)	6	2		X
39	Tractor, Tracked	1	1		
40	Trailer, ¼ Ton, Cargo	13	8	X	X
41	Trailer, 3/4 Ton, Cargo	17	4	X	X
42	Trailer, 3/4 Ton, ARC/MIG	1	1	X	X
43	Trailer, 3/4 Ton, Lubrication	3	2	X	X
44	Trailer, 3/4 Ton, 3 KW Gen	1	1	X	X
45	Trailer, 3/4 Ton, 5 KW Gen	12	-	X	X
46	Trailer, 1½ Ton, Cargo	23	22		X
47	Trailer, 1½ Ton, Auto Rep Load B	2	1		X
48	Trailer, 1½ Ton, Auto Rep Load D	2	1		X
49	Trailer, 1½ Ton, Water	2	2		X
50	Trailer, 1½ Ton, 10 KW Gen	7	8		X
51	13 Ton Semi-trailer	1	-		X
52	20 Ton Semi-trailer	1	1		X
53	30 Ton Semi-trailer	1	-		X
54	60 Ton Semi-trailer	1	-		
55	25 KW Generator	3	-		X
	SPECIAL OPERATIONAL REQUIREMENTS				
56	Truck, 2½ Ton, Van (Spere Parts)	-	2		
57	Trailer, 1½ Ton, Welding	-	2		X

On the manpower side, we are now established to provide either a light field workshop, or about half a medium field workshop. We do have a capability in all repair trades, but the depth is lacking in several areas. As you can see from this chart, the present authorized organization is almost identical to that of a light field workshop.

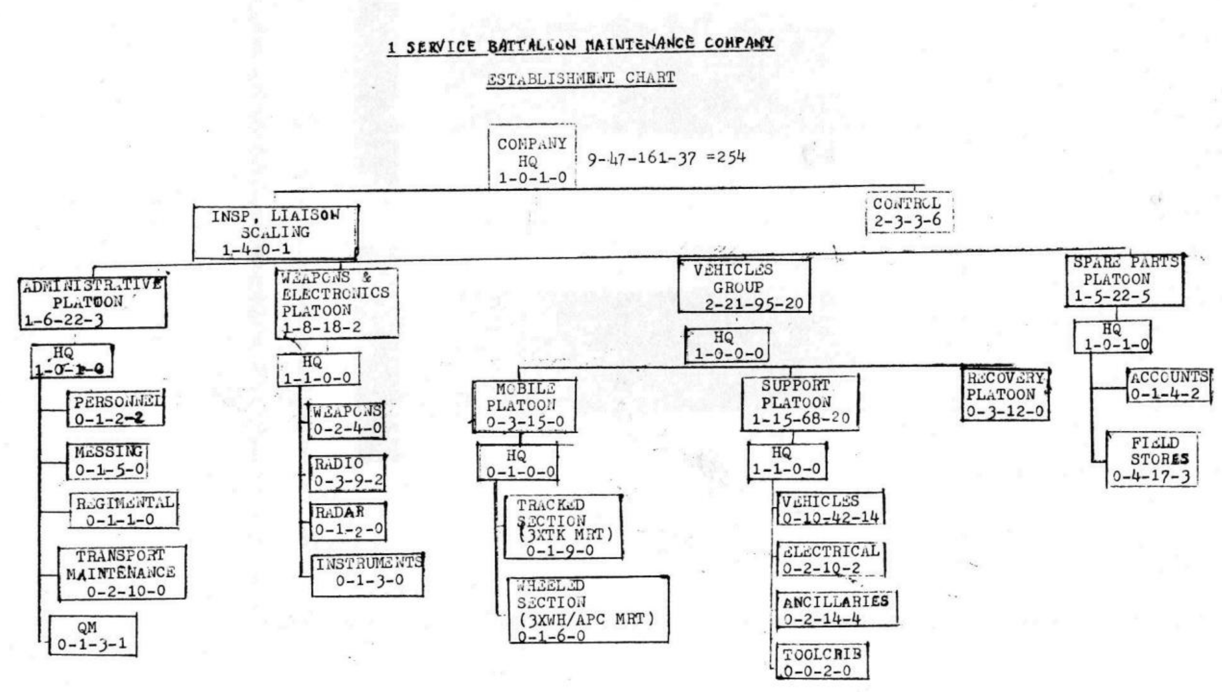


The light field workshop consists of the following elements:

- Workshop Headquarters
    - Inspection, Liaison and Scaling Section
    - Control Office
- Administrative Platoon
    - Personnel Section
    - Messing Section
    - Regimental Duties Section
    - Transport and Maintenance Section
    - Quartermaster Section
- Weapons and Electronics Platoon
    - Weapons Section
    - Radio Section
    - Radar Section

- Vehicle Platoon
  - Mobile Section
    - 3 x Mobile Repair Groups
  - Support Section
    - Vehicles
    - Electrical
    - Metals
    - Stores
  - Recovery Section
- Spare Parts Platoon
  - Accounts Section
  - Stores Section

The maintenance company organization is almost identical.



In fact, here in Calgary, the maintenance company cannot operate on its formal establishment. It is not known from one day to the next who is going to be posted, who is coming in, or who is being promoted. This is a training and production sub-unit with many tasks; therefore a working organization has been developed to utilize our manpower in the most effective manner.

The actual working organization groups tradesmen by trade functions into two basic elements; a base repair group, and a mobile repair group. This expedient was forced on the company because of the existing accommodation. Mobile resources are employed from a 40-vehicle garage, while the base facility is a standard 100-man workshop with a tank addition. The spare parts platoon is in an old aircraft hangar.

The mobile repair group is the nucleus for field deployment. It is normally tasked with first and second line repair of maintenance company vehicles, but elements of all other trade fields are attached from the base repair group to fill out into the organization and vehicle configuration required for the task at hand, which might range from support to 3 Field Squadron, RCE, on the Wainwright airfield project, an infantry company exercise, or a Fort Garry Horse regimental operation, to two infantry battalion groups in the Defence of Canada role. The working organization is flexible, and tradesmen are pooled by trade for normal trades training and repair during non-operational periods.

We therefore are capable of providing either a skeleton light or medium field workshop for training purposes. We also have the capacity to provide some measure of second line maintenance support to 1 Combat Group task force operations from the size of an infantry company group up to a brigade group. Quality will be there, but not quantity.

As you can see, the Mobile Command maintenance support plan for a task force can be tailored to fit the requirement. Maintenance resources are available to the CAR on permanent allocation, 2 and 5 Service Battalions are capable of providing a light field workshop, 1 and 3 Service Battalions are established to provide either a medium field workshop or a light field workshop. Maintenance personnel from bases across the country are also available. The Mobile Command reserves are envisaged as direct augmentation in a national emergency, and volunteer tradesmen can also be considered.

1 Service Battalion has tasks for war, tasks for peace, and tasks for peacekeeping. The Maintenance Company will have a very good equipment capability when its full entitlement is received, and a broad spectrum of repair trade coverage, but limited manpower backup. The keynote today is flexibility, and we have the resources to provide a second line maintenance element for most 1 Combat Group exercises, provided they are not sustained, or occur too frequently.

C.A. Millar
Major
OC 1 Service Battalion Maintenance Company
6 June 69

1 Combat Group
1 Service Battalion Maintenance Company

Maintenance Support Plan for a Battalion Group Task Force in Defence of Canada Operations

Maintenance is essential to the sustained support of any operational military task. The aim of this presentation is to outline a proposed maintenance support plan for a battalion-sized task force in the Defence of Canada role, and then to table a few of the important factors which must be considered during the actual organization and deployment of maintenance resources.

The word maintenance has several connotations, therefore it should be explained that the term used here will refer to equipment servicing, repair, spare parts, and recovery. The level of maintenance will be further qualified by reference to first line maintenance being a unit responsibility, second line maintenance as a service battalion or base task, auxiliary second line as the medium field workshop role, and third line as depot facilities.

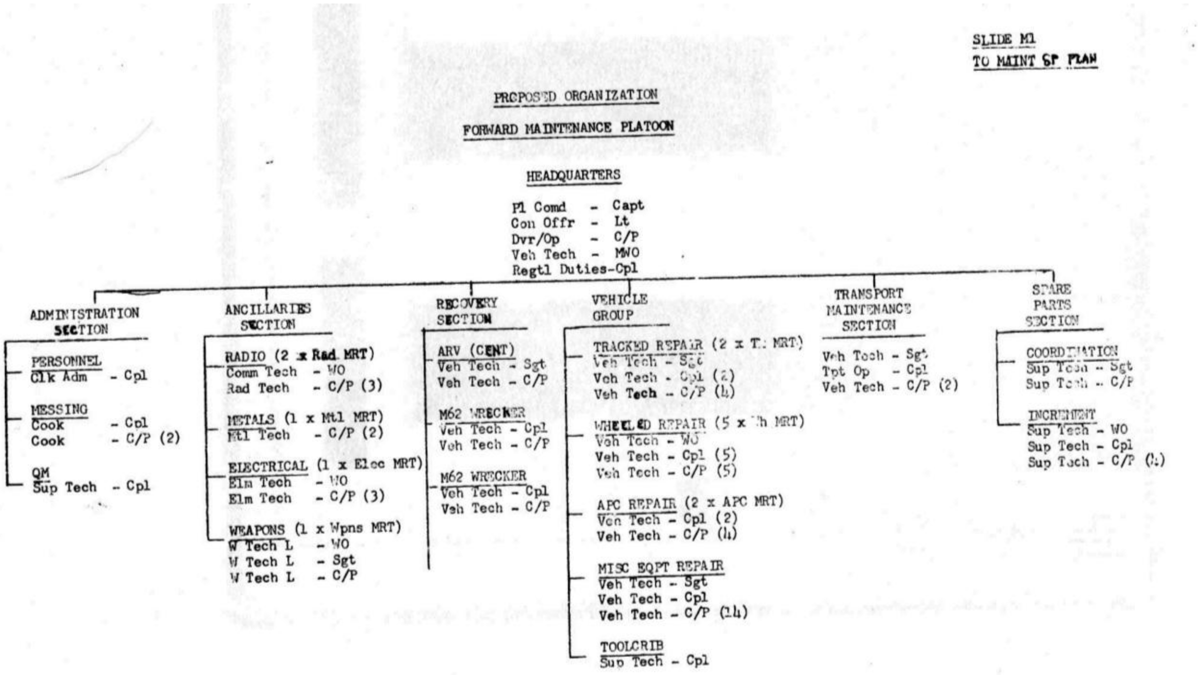
The Service Battalion of 1 Combat Group has a good maintenance support potential, primarily because the maintenance company is currently being scaled in equipment for the role of a medium field workshop in mobile base operations. The company is restricted in peace to only about half the manpower of the medium workshop, but all major repair trades are included in our current military establishment of 219 men, a large equipment holding, and broad trade coverage gives the service battalion a very good capability, and flexibility, in supporting various types of task forces.

The maintenance support plan for an infantry battalion group task force is based on several basic assumptions:

1. All unit equipment is in fully operational condition,
2. Units and sub-units in the task force have their full slate of first line maintenance personnel and equipment participating in the operation.
3. The major unit is carrying its full 15-day authorized holding of unit spare parts, and
4. Unit recovery resources have been included in the task force.

For the model battalion group task force under consideration, a forward maintenance platoon has been designed that is capable of providing second line maintenance support for almost all the major items of equipment normally found in the units of 1 Combat Group. The diagram below notes the organization and details are at Annex A.

The actual composition of the platoon is purely an educated guess based on several exercises over the past few years. As you can well appreciate, a short tactical operation of say, seven days, would require very little maintenance backup, if the basic assumptions I outlined earlier were correct, and the enemy caused relatively few casualties to the task force equipment. However, if operations are prolonged to a month, or longer, considerable maintenance backup will be required by the battalion group. Our experience indicates that an ad-hoc second line maintenance workshop of between 80 and 100 tradesmen is necessary for sustained support to an infantry battalion group during field exercises of up to 30 days.



SLIDE M1
TO MAINT SP PLAN

PROPOSED ORGANIZATION

FORWARD MAINTENANCE PLATOON

HEADQUARTERS

Pl Comd - Capt
Con Offr - Lt
Dvr/Op - C/P
Veh Tech - MWO
Regtl Duties-Cpl

ADMINISTRATION SECTION

PERSONNEL
Clk Adm - Cpl

MESSING
Cook - Cpl
Cook - C/P (2)

QM
Sup Tech - Cpl

ANCILLARIES SECTION

RADIO (2 x Rad MRT)
Comm Tech - WO
Rad Tech - C/P (3)

METALS (1 x Mtl MRT)
Mtl Tech - C/P (2)

ELECTRICAL (1 x Elec MRT)
Elm Tech - WO
Elm Tech - C/P (3)

WEAPONS (1 x Wpns MRT)
W Tech L - WO
W Tech L - Sgt
W Tech L - C/P

RECOVERY SECTION

ARV (CENT)
Veh Tech - Sgt
Veh Tech - C/P

M62 WRECKER
Veh Tech - Cpl
Veh Tech - C/P

M62 WRECKER
Veh Tech - Cpl
Veh Tech - C/P

VEHICLE GROUP

TRACKED REPAIR (2 x Tk MRT)
Veh Tech - Sgt
Veh Tech - Cpl (2)
Veh Tech - C/P (4)

WHEELED REPAIR (5 x Wh MRT)
Veh Tech - WO
Veh Tech - Cpl (5)
Veh Tech - C/P (5)

APC REPAIR (2 x APC MRT)
Veh Tech - Cpl (2)
Veh Tech - C/P (4)

MISC EQPT REPAIR
Veh Tech - Sgt
Veh Tech - Cpl
Veh Tech - C/P (14)

TOOLCRIB
Sup Tech - Cpl

TRANSPORT MAINTENANCE SECTION

Veh Tech - Sgt
Tpt Op - Cpl
Veh Tech - C/P (2)

SPARE PARTS SECTION

COORDINATION
Sup Tech - Sgt
Sup Tech - C/P

INCREMENT
Sup Tech - WO
Sup Tech - Cpl
Sup Tech - C/P (4)

Our assessment in quantitative terms may be wrong, but augmentation is available from 1 Service Battalion, other bases, Mobile Command reserves, and local volunteers in any national emergency.

Yardstick manpower figures are available from the EME manual in the event that a prolonged and sustained operation is anticipated.

This proposed organization contains all the elements required to perform in situ repair, provide backup repair in the forward airfield area, supply spare parts, give recovery assistance, and control the back loading of special repairs to the supporting base or depots. The platoon is self-contained and fully mobile, but not all vehicles are air portable.

The structure consists of the following elements:

Headquarters

Platoon Commander	- Command and liaison
Control Officer	- Repair & Recovery Control.
Vehicle Artificer	- Technical Inspections (Quality Assurance).

Administration Section:

Orderly Room Clerk, Cooks, QM

Ancillaries Section:

Radio Mobile Repair Teams (MRT)

Welding MRT

Electrical MRT

Weapons MRT

- Recovery Section:
    - Armoured Recovery Vehicle (Centurion) w/radio
    - 2 x M62 Wreckers
- Transport & Maintenance Section (for first line maintenance to platoon equipment).
- Spare Parts Section:
    - Spare Parts representatives
    - Spare Parts increment, if the complete backup of the maintenance company is required for the operation under circumstances where it is not more economical or practical to ship all spare parts in by air on an "as required" basis
- Vehicle Group
    - Tracked Vehicle Section:
        - Tracked MRTs for Centurion
        - HIAB cranes for heavy lift of tank assemblies
    - APC Section:
        - 2 X Mll3A1 APC, w/radio fitted for APC repair.
        - Ad-hoc arrangements.
    - Wheeled Vehicle Section:
        - Wheeled MRTs
    - Miscellaneous Equipment Section:
        - Tradesmen for repair of heaters, generators, pumps, components, assemblies, and special equipments.
    - Tool crib.
- Portable workshop shelters, heaters, HIAB crane for heavy lift, and generators for power tools, heaters, and lighting.

This organization would have the capability of repairing most of the task force equipment. Notable exceptions are radar, instrument, machine shop, and heavy automotive facilities. It is considered more economical to backload certain jobs to rear areas where they can be properly repaired, than to deploy large and expensive resources to a forward region in support of small numbers of equipments.

In the deployment of the maintenance element to an active are of operations, the use of local facilities and resources will be an important consideration. A practical method of obtaining proper accommodation might be the occupation of existing civilian garages, arenas, public works buildings, repair shops, or even barns. Stocks of standard commercial spare parts, plumbing supplies, industrial gases, and other useful items will reduce the resupply demand on the logistics system. Local expedients, controlled cannibalization, utilization of local tradesmen, civilian recovery vehicles, and other techniques can minimize the maintenance load.

Under certain circumstances, repair by replacement may be the most practical method of operation. It should be considered that shipping small equipments out of the forward area by air could be the sole means of providing the required repair service when the task force is totally dependent on the *Buffalo* aircraft. Even when *Hercules* aircraft are available, it may be more economical to ship items in and out, rather than move repair facilities forward.

Although a mobile repair team capability has been provided for tracked, wheeled, APC, radio, and weapon equipments, the use of MRTs is not an economical proposition at any time, except when an extremely urgent operational commitment is in jeopardy.

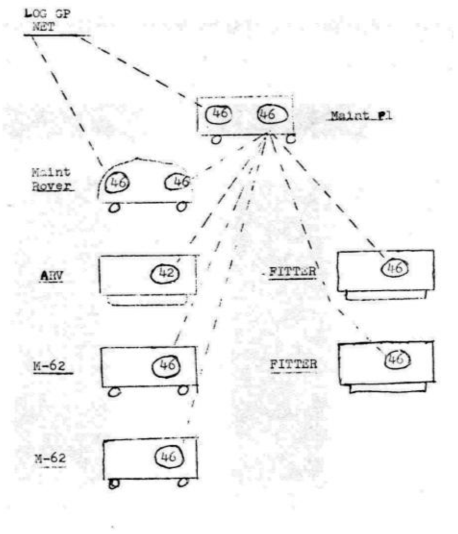
Maintenance resources should be centralized at the highest level for maximum efficiency, and there is a good case for either placing the maintenance elements of the infantry battalion group under the command of the forward maintenance platoon commander, or the second line increment under the command of the maintenance officer of the infantry battalion. In any event the resources of the task force should be controlled by the senior maintenance officer of the force. It has been noted that during task force exercises in 1 Combat Group, those resources have not been centralized at battalion group level, and all recovery vehicles, tradesmen, and spare parts were not always utilized. It should be remembered that it is normal for independent artillery batteries, armoured squadrons, and similar detachments to have a slice of maintenance resources attached from the parent unit. Centralized maintenance resources will achieve maximum flexibility and economy of effort for any composite force.

The only vehicles of this platoon which are air-portable in the *Buffalo* are one jeep and its trailer. It is intended to develop at least one vehicle MRT which can be stripped down, but 1 Service Battalion Maintenance Company does not have that capability yet. The only vehicles of this platoon that are not air-portable in the *Hercules* are the QM stores van, the automotive electrical van, the small arms repair van, the tool crib, and the ARV (Centurion). The spare parts increment is not air-portable at the present time, but the feasibility will be studied when the spare parts platoon reorganizes into its new mobile base configuration.

At present, the maintenance platoon would have one radio in each of the two fitter vehicles and one radio in the ARV (Centurion). Those radios would operate on the logistics net as outstations only when deployed on repair or recovery tasks. Additional radios will be provided for the platoon commander, control officer, and M62 wreckers when the maintenance company eventually receives its new authorized radio holdings.

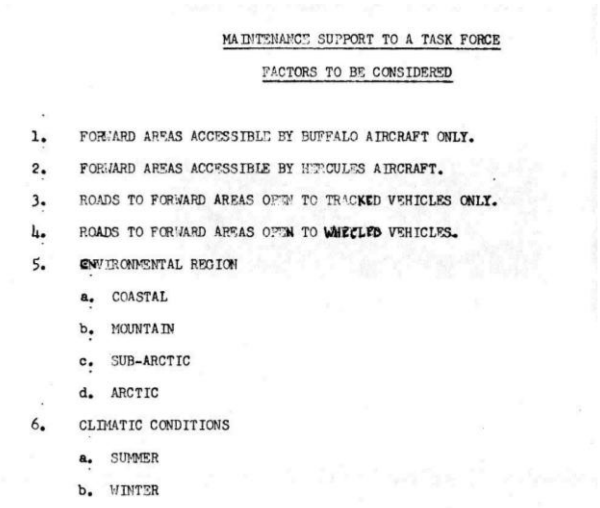
FORWARD MAINTENANCE PLATOON

RADIO DIAGRAM



This organization is a guide to the type of maintenance support which might be provided to a task force under exercise, or actual operation. Flexibility is the keynote, and the service battalion has a generally good capability of supplying the maintenance backup required to meet the task.

It should be pointed out that there are a number of major factors which must be considered in the deployment of maintenance support.



MAINTENANCE SUPPORT TO A TASK FORCE

FACTORS TO BE CONSIDERED

1. FORWARD AREAS ACCESSIBLE BY BUFFALO AIRCRAFT ONLY.
2. FORWARD AREAS ACCESSIBLE BY HERCULES AIRCRAFT.
3. ROADS TO FORWARD AREAS OPEN TO TRACKED VEHICLES ONLY.
4. ROADS TO FORWARD AREAS OPEN TO WHEELED VEHICLES.
5. ENVIRONMENTAL REGION
    a. COASTAL
    b. MOUNTAIN
    c. SUB-ARCTIC
    d. ARCTIC
6. CLIMATIC CONDITIONS
    a. SUMMER
    b. WINTER

The first consideration is support to a task force deployed from a forward airfield reached solely by *Buffalo* aircraft. Such a case will cause a severe restriction on the logistics support to that force. Some ¼-ton vehicles, stripped down ¾-ton vehicles, personnel trailers, and bulk stores can be moved in, but effective support will be difficult to attain. Under those conditions, the second line maintenance organization might consist solely of a repair coordinator, spare parts representative, tradesmen, toolboxes, palletized spare parts, Fritsche shelters, heaters, and generators.

Once the forward airfield opens to *Hercules* aircraft, most of the service battalion resources become available to the force. As APCs, *Lynx* and other major equipment begin to move forward by air, additional logistics backup must be provided.

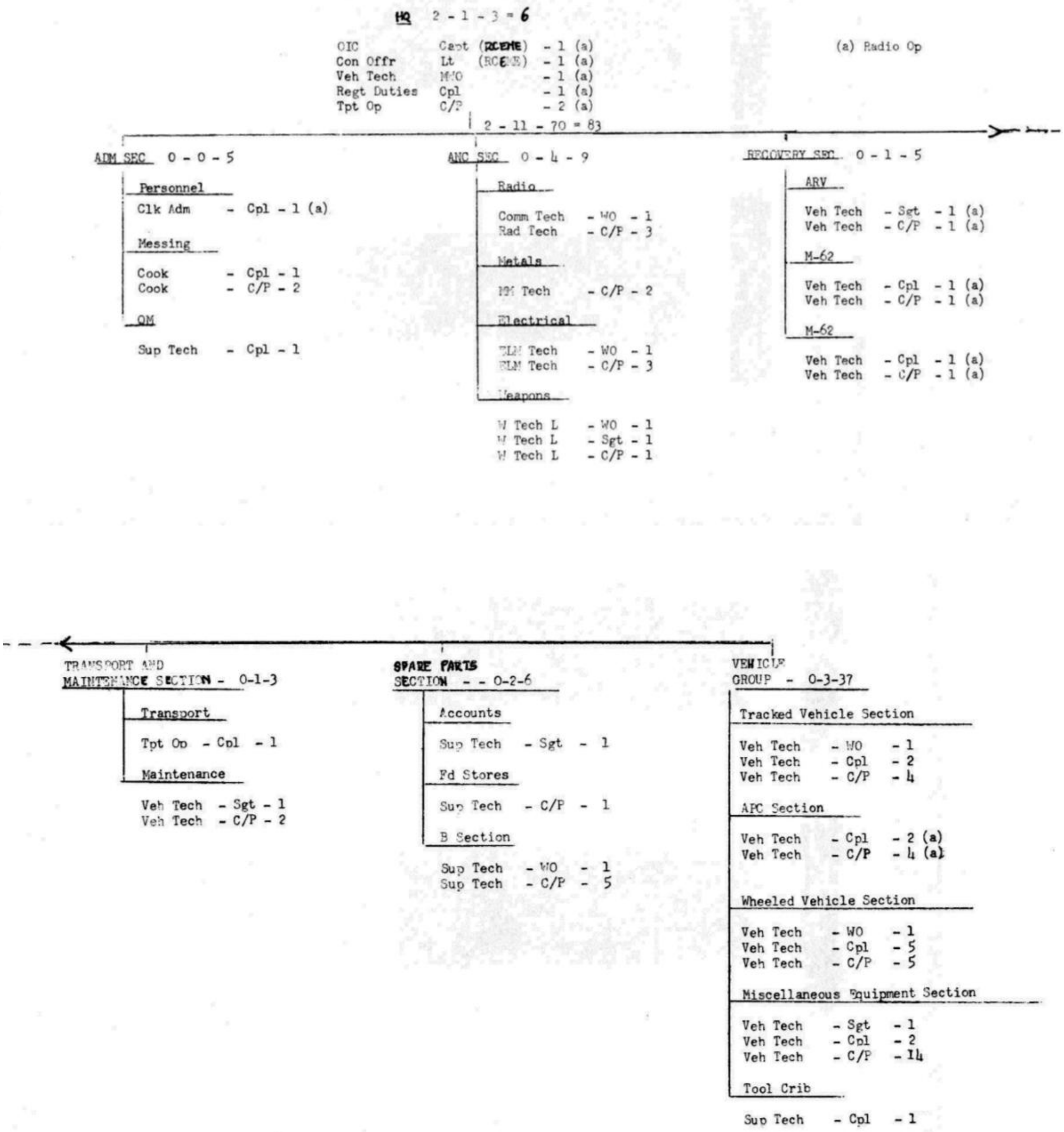
When roads open to tanks and large numbers of tracked vehicles, additional support resources must be phased into the movement plan ahead of the anticipated demand for services. It is really not until road traffic is open to wheeled vehicles that all the current resources of the maintenance company can be utilized effectively.

During other 1 Combat Group study periods, at least four distinct environmental regions have been established as possible areas of operation for task forces in Defence of Canada: coastal, mountain, sub-arctic, and arctic. Each region will require special consideration for the development of a maintenance support organization, especially when problems associated with climatic conditions modify the support plan.

1 Service Battalion has presented an organization for a forward maintenance platoon in support of a battalion group task force in Defence of Canada Operations. The composition of this company should not be considered to be a fixed establishment since many factors must be considered in the planning for the task at hand. Maintenance support must be flexible, so that it can be organized to meet the actual requirements of the task force.

C.A. Millar
Major
OC 1 Service Battalion Maintenance Company
6 June 69

Annex A



HQ 2 - 1 - 3 = 6

OIC Capt (RCEME) - 1 (a)
Con Offr Lt (RCEME) - 1 (a)
Veh Tech MWO - 1 (a)
Regt Duties Cpl - 1 (a)
Tpt Op C/P - 2 (a)

(a) Radio Op

2 - 11 - 70 = 83

ADM SEC 0 - 0 - 5

Personnel
Clk Adm - Cpl - 1 (a)

Messing
Cook - Cpl - 1
Cook - C/P - 2

QM
Sup Tech - Cpl - 1

ANC SEC 0 - 4 - 9

Radio
Comm Tech - WO - 1
Rad Tech - C/P - 3

Metals
MM Tech - C/P - 2

Electrical
ELM Tech - WO - 1
ELM Tech - C/P - 3

Weapons
W Tech L - WO - 1
W Tech L - Sgt - 1
W Tech L - C/P - 1

RECOVERY SEC 0 - 1 - 5

ARV
Veh Tech - Sgt - 1 (a)
Veh Tech - C/P - 1 (a)

M-62
Veh Tech - Cpl - 1 (a)
Veh Tech - C/P - 1 (a)

M-62
Veh Tech - Cpl - 1 (a)
Veh Tech - C/P - 1 (a)

TRANSPORT AND
MAINTENANCE SECTION - 0-1-3

Transport
Tpt Op - Cpl - 1

Maintenance
Veh Tech - Sgt - 1
Veh Tech - C/P - 2

SPARE PARTS
SECTION - - 0-2-6

Accounts
Sup Tech - Sgt - 1

Fd Stores
Sup Tech - C/P - 1

B Section
Sup Tech - WO - 1
Sup Tech - C/P - 5

VEHICLE
GROUP - 0-3-37

Tracked Vehicle Section
Veh Tech - WO - 1
Veh Tech - Cpl - 2
Veh Tech - C/P - 4

APC Section
Veh Tech - Cpl - 2 (a)
Veh Tech - C/P - 4 (a)

Wheeled Vehicle Section
Veh Tech - WO - 1
Veh Tech - Cpl - 5
Veh Tech - C/P - 5

Miscellaneous Equipment Section
Veh Tech - Sgt - 1
Veh Tech - Cpl - 2
Veh Tech - C/P - 14

Tool Crib
Sup Tech - Cpl - 1

ANNEX "A" TO
MAINT SUPPORT PLAN

PROPOSED ESTABLISHMENT
FORWARD MAINTENANCE PLATOON
FOR SUPPORT OF A BATTALION GROUP TASK FORCE
UNDER DCF/ALCANUS OPERATIONS

HEADQUARTERS

1.	Truck Utility ¼ ton w/radio (2)	Capt	RCEME	OIC
2.	Trailer ¼ ton Cargo	C/P	Tpt Op	Dvr/Op
3.	Truck PU 3/4 ton office	Lt	RCEME	Control Offr
4.	Trailer 3/4 ton Cargo	C/P	Tpt Op	Pers Kit
5.	Truck 3/4 ton Cargo	MWO	Veh Tech	Regt'l Stores
6.	Trailer 3/4 ton Cargo	Cpl	Regtl Duties	Regt'l Stores

ADMINISTRATIVE SECTION

7.	Truck PU 3/4 ton w/radio (2)	Cpl	Clk Adm	OR
8.	Trailer 3/4 ton Cargo	C/P	Veh Tech	Adm Stores
9.	Truck 2½ ton Kitchen	Cpl	Cook	Kitchen
10.	Trailer 330 gal Water	C/P	Cook	Water
11.	Truck 3/4 ton Cargo	C/P	Cook	Rations
12.	Trailer 3/4 Ton Cargo	C/P	Veh Tech	Pers Kit
13.	Truck 2½ ton Security	Cpl	Sup Tech	QM
14.	Trailer 1½ ton Security	C/P	Veh Tech	QM
14A.	Truck Water	Cpl	Veh Tech	
14B.	Trailer Water	C/P	Veh Tech	

ANCILLARIES SECTION

15.	Truck PU 3/4 ton w/Rad Repair Kit	WO	Comm Tech	Rad MRT
16.	Trailer 3/4 ton, 5 KW Gen	C/P	Rad Tech	
17.	Truck PU 3/4 ton, w/Rad Rep Kit	C/P	Rad Tech	Rad MRT
18.	Trailer 3/4 ton, 5 KW Gen	C/P	Rad Tech	
19.	Truck 3/4 ton w/welding kit	C/P	Mtl Tech	Mtl MRT
20.	Trailer 3/4 ton welding kit	C/P	Mtl Tech	
21.	Truck PU 3/4 ton	WO	Elm Tech	Elec MRT
22.	Trailer 3/4 ton Cargo	C/P	Elm Tech	
23.	Truck 2½ ton Auto Elec	C/P	Elm Tech	
24.	Trailer 1½ ton, 10 KW Gen	C/P	Elm Tech	
25.	Truck 3/4 ton Cargo	WO	W Tech L	Wpns MRT
26.	Trailer 3/4 ton Cargo	C/P	W Tech L	
27.	Truck 2½ ton SA Repair	Sgt	W Tech L	
28.	Trailer 1½ ton Armt Repair	C/P	Veh Tech	

RECOVERY SECTION

29.	ARV (Centurion) w/radio (1)	Sgt C/P	Veh Tech Veh Tech
30.	Truck 5 ton wrecker w/radio (1)	Cpl C/P	Veh Tech
31.	Truck 5 ton Wrecker w/radio (1)	Cpl C/P	Veh Tech Veh Tech

.../2

- 2 -

TRANSPORT AND MAINTENANCE SECTION

32.	Truck 2½ Ton Cargo	Cpl	Tpt Op	POL
		C/P	Veh Tech	
33.	Truck, 3/4 ton w/URK	Sgt	Veh Tech	Unit Servicing
34.	Trailer, 3/4 ton, lub	C/P	Veh Tech	

SPARE PARTS SECTION

35.	Truck, PU, 3/4 ton Office	Sgt	Sup Tech	
36.	Trailer, 3/4 ton, Cargo	C/P	Sup Tech	

VEHICLE GROUP

TRACKED VEHICLE SECTION

37.	Truck 3/4 ton, Cargo	WO	Veh Tech	
38.	Trailer, 3/4 ton, Cargo	C/P	Veh Tech	
39.	Truck 2½ Ton HIAB	Cpl	Veh Tech	Tk MRT
40.	Trailer, 1½ ton, Cargo	C/P	Veh Tech	
41.	Truck, 2½ ton HIAB	Cpl	Veh Tech	Tk MRT
42.	Trailer, 1½ ton, Cargo	C/P	Veh Tech	

APC SECTION

43.	Fitter Vehicle w/radio (1)	Cpl	Veh Tech	APC MRT
		C/P	Veh Tech	
44.	Fitter Vehicle w/radio (1)	Cpl	Veh Tech	APC MRT
		C/P	Veh Tech	

WHEELED VEHICLE SECTION

45.	Truck 3/4 Ton Cargo	WO	Veh Tech	
46.	Trailer 3/4 Ton Cargo			
47.	Truck 3/4 ton Cargo	C/P	Veh Tech	Wh MRT
48.	Trailer 3/4 ton Cargo			
49.	Truck 3/4 ton Cargo	Cpl	Veh Tech	Wh MRT
50.	Trailer 3/4 ton Cargo	C/P	Veh Tech	
51.	Truck 3/4 ton Cargo	Cpl	Veh Tech	Wh MRT
52.	Trailer 3/4 ton Cargo	C/P	Veh Tech	
53.	Truck 3/4 ton, Cargo	Cpl	Veh Tech	Wh MRT
54.	Trailer 3/4 ton, Cargo	C/P	Veh Tech	
55.	Truck 3/4 ton, Cargo	Cpl	Veh Tech	Wh MRT
56.	Trailer, 3/4 ton, Cargo			
57.	Truck 2½ ton Cargo	Cpl	Veh Tech	
58.	Trailer 1½ ton, 10 KW Gen	C/P	Veh Tech	

MISCELLANEOUS EQUIPMENT SECTION

59.	Truck 3/4 ton, Cargo	Sgt	Veh Tech	
60.	Trailer 3/4 ton, Cargo			
61.	Truck 2½ ton, Tool crib	Cpl	Sup Tech	
62.	Trailer 1½ ton, Security			
63.	Truck 2½ ton, Cargo	C/P	Veh Tech	Fritsche
64.	Trailer, 1½ ton, Cargo			Heaters
65.	Truck 2½ ton, Cargo	C/P	Veh Tech	Heaters
66.	Trailer 1½ ton Cargo			Heaters
67.	Truck 2½ ton HIAB	Cpl	Veh Tech	
68.	Trailer 1½ ton 10 KW Gen			

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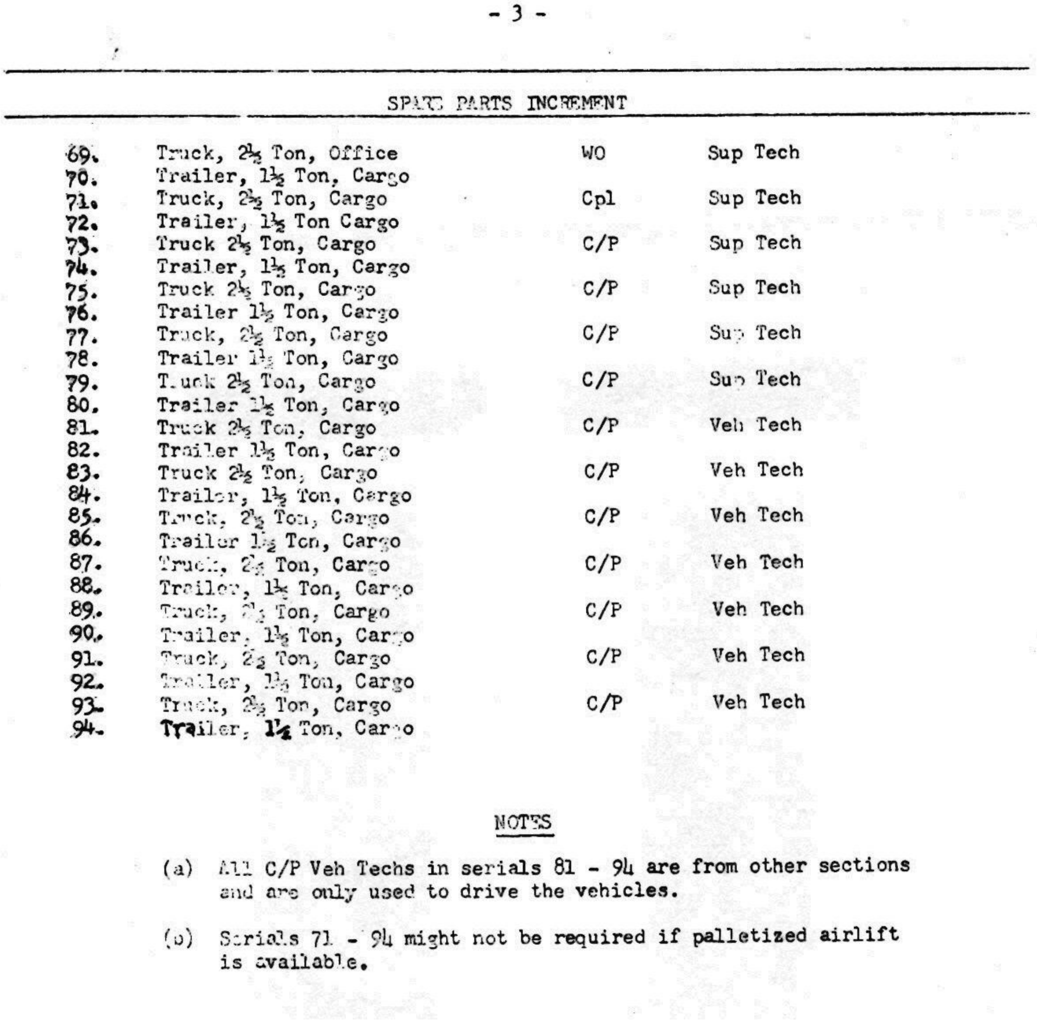

- 3 -

SPARE PARTS INCREMENT

69.	Truck, 2½ Ton, Office	WO	Sup Tech
70.	Trailer, 1½ Ton, Cargo		
71.	Truck, 2½ Ton, Cargo	Cpl	Sup Tech
72.	Trailer, 1½ Ton Cargo		
73.	Truck 2½ Ton, Cargo	C/P	Sup Tech
74.	Trailer, 1½ Ton, Cargo		
75.	Truck 2½ Ton, Cargo	C/P	Sup Tech
76.	Trailer 1½ Ton, Cargo		
77.	Truck, 2½ Ton, Cargo	C/P	Sup Tech
78.	Trailer 1½ Ton, Cargo		
79.	Truck 2½ Ton, Cargo	C/P	Sup Tech
80.	Trailer 1½ Ton, Cargo		
81.	Truck 2½ Ton, Cargo	C/P	Veh Tech
82.	Trailer 1½ Ton, Cargo		
83.	Truck 2½ Ton, Cargo	C/P	Veh Tech
84.	Trailer, 1½ Ton, Cargo		
85.	Truck, 2½ Ton, Cargo	C/P	Veh Tech
86.	Trailer 1½ Ton, Cargo		
87.	Truck, 2½ Ton, Cargo	C/P	Veh Tech
88.	Trailer, 1½ Ton, Cargo		
89.	Truck, 2½ Ton, Cargo	C/P	Veh Tech
90.	Trailer, 1½ Ton, Cargo		
91.	Truck, 2½ Ton, Cargo	C/P	Veh Tech
92.	Trailer, 1½ Ton, Cargo		
93.	Truck, 2½ Ton, Cargo	C/P	Veh Tech
94.	Trailer, 1½ Ton, Cargo		

NOTES

(a) All C/P Veh Techs in serials 81 - 94 are from other sections and are only used to drive the vehicles.

(b) Serials 71 - 94 might not be required if palletized airlift is available.